Cambridge OCR-set Assignment

Sample Assessment Material

Cambridge OCR Level 3 Alternative Academic Qualification
Cambridge Advanced National in Cyber Security and Networks

Unit F198: Implementing secure Local Area Networks (LANs)

Scenario Title: CB Nursery School Local Area Network (LAN) upgrade

Valid for assessment from September 20XX to 20XX.
For use by students beginning the qualification in September 20XX.

This is a sample Cambridge OCR-set assignment which should only be used for practice**.**

This assignment **must not** be used for live assessment of students.

The live assignments will be available on our secure website, 'Teach Cambridge'.

The Cambridge OCR administrative codes linked to this unit are:

- unit entry code F198
- certification code H137

The regulated qualification number linked to this unit is:

610/6208/X

Duration

About 15 hours of supervised time (GLH)
(work that **must** be completed under teacher supervised conditions)

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Information and instructions for teachers

Using this assignment

This assignment provides a scenario and set of related tasks that reflect how IT network support staff would implement secure Local Area Networks (LANs).

You can give this to students on or after 1 June 202X to help them understand it before they start using it for assessment. The dates for which students can use it for assessment are shown on the front cover.

The assignment:
- Is written so that students have the opportunity to meet the requirements of all assessment criteria for the unit.
- Will tell students if their evidence must be in a specific format. If the task does not specify a format, students can choose the format to use.
- **Must** be completed under teacher supervision. Any unsupervised time allowed will be stated below and explained in the assessment guidance.

We have estimated that this assignment will take about 15 hours of supervised time to complete. Students should need approximately:
- 2 hours to complete Task 1.
- 3 hours to complete Task 2.
- 8 hours to complete Task 3.
- 2 hours to complete Task 4.

You **must**:
- Use a Cambridge OCR-set assignment for summative assessment of students.
- Familiarise yourself with the assessment criteria and assessment guidance for the tasks. These are given at the end of each student task. They are also with the unit content in **Section 5** of the Specification.
  Assessment guidance is only given where additional information is needed. There might not be assessment guidance for each criterion.
- Make sure students understand that the assessment criteria and assessment guidance tell them in detail what to do in each task.
- Read and understand **all** the rules and guidance in **Section 7** of the Specification **before** your students start the set assignments.
- Make sure that your students complete the tasks and that you assess the tasks fully in line with the rules and guidance in **Section 7** of the Specification.
- Give your students the **Cyber Security and Networks Student guide to NEA assignments before** they start the assignments.
- Complete the **Teacher Observation Record** for **Task 3**. You **must** follow

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the guidance given when completing it.

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You **must not**:

- Use live Cambridge OCR-set assignments for practice or formative assessment. This sample assessment material **can** be used for practice or formative assessment.
- Use this sample assessment material for live assessment of students.
- Allow group work for **any** task in this assignment.
- Change any part of the Cambridge OCR-set assignments or assessment criteria.

Information for delivering tasks

Task	Requirements
Task 3	Students **must** have access to a private network that they will be able to work on without restrictions. They **must** be able to: • Connect and configure components • Configure and modify the infrastructure • Configure and modify the security • Install, update, and remove software. The composition of the network, as well as available resources and tools, must be sufficient to ensure that students are able to achieve all of the assessment criteria. When students are provided with network hardware components to connect and configure, make sure that all relevant health and safety policies and procedures are followed. You **must** intervene if there's a health and safety risk and reflect this in your assessment if the student needed additional help in order to work safely and independently to meet the assessment criteria in this task.

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Pages 1-4 are for teachers only. Please do **not** give **Pages 1-4** to your students.

You can give **any** or **all** of the pages **that follow** to your students.

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Tasks for students and assessment criteria

Unit F198: Implementing secure Local Area Networks (LANs)

Scenario title: CB Nursery School Local Area Network (LAN) upgrade

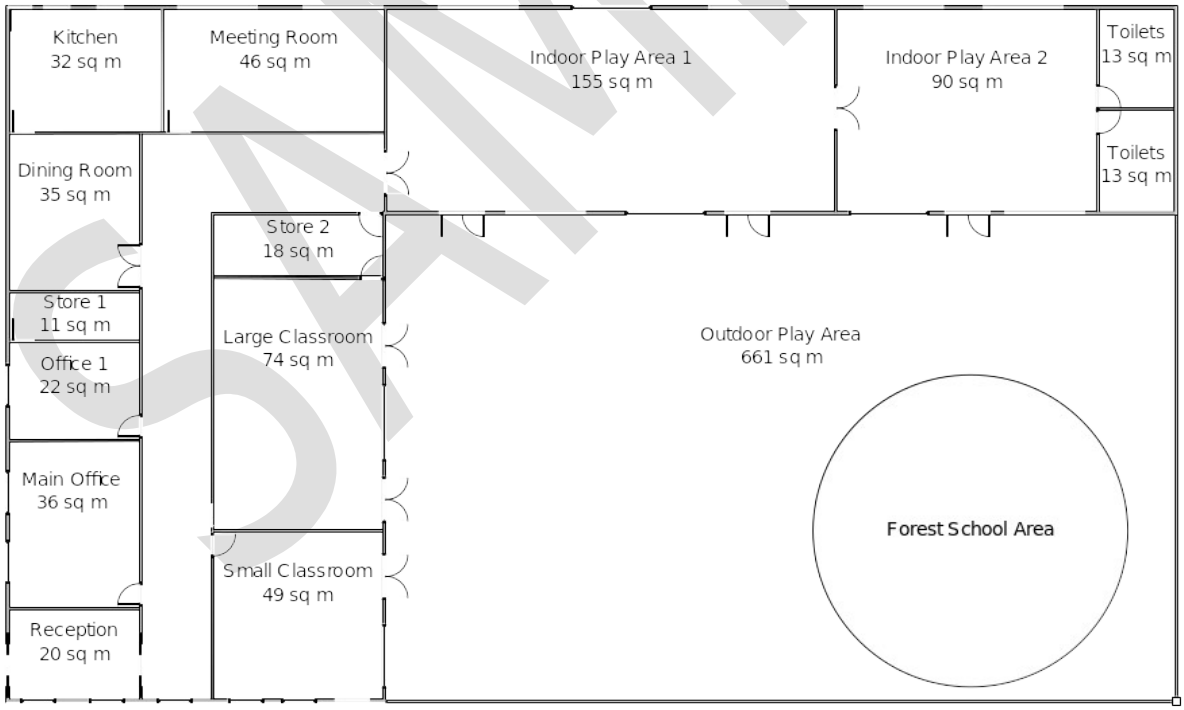
Valid for assessment from September 20XX to 20XX.
For use by students beginning the qualification in September 20XX.

Scenario

CB Nursery School has asked for an upgraded and secured Local Area Network (LAN) to allow them to extend their current LAN. CB Nursery School also wants to be able to connect additional IT devices to the LAN and improve network security.

Information on CB Nursery School

CB Nursery School is based in a modern building. The physical layout plan of the building is shown below.



CB Nursery School's staff list

- 1 Receptionist
- 1 Administration Manager

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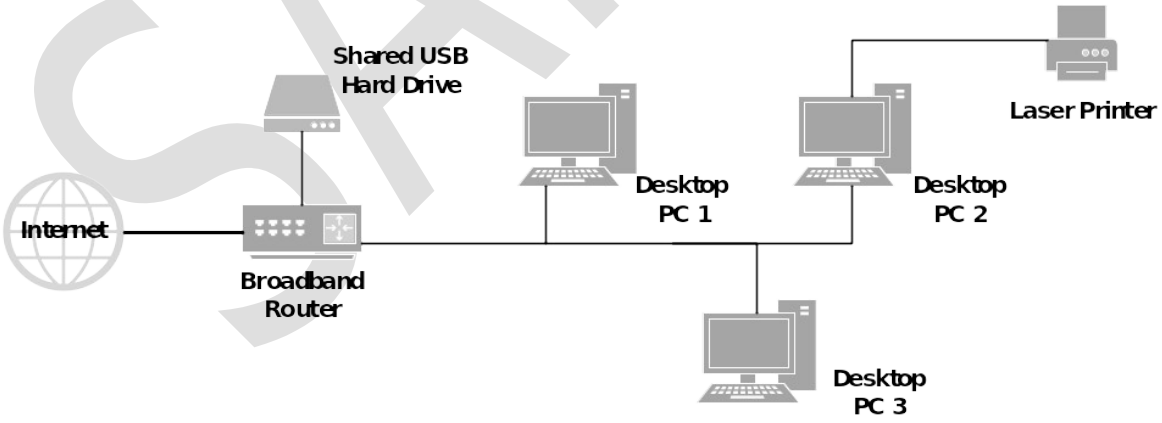
- 1 Administration Assistant
- 4 Teachers
- 6 Teaching Assistants
- 1 Cook

CB Nursery School's current IT equipment and connectivity

Current Equipment	Location	Notes
Desktop PC 1	Reception	Connected to Broadband Router - CAT5
Desktop PC 2	Main Office	Connected to Broadband Router - CAT5
Desktop PC 3	Office 1	Connected to Broadband Router - CAT5
Telephone 1	Reception	Telephone switchboard
Telephone 2	Main Office	
Telephone 3	Office 1	
Telephone 4	Kitchen	
Broadband Router	Main Office	Broadband Router used to supply wired CAT5 ethernet network connection to all three Desktop PCs.
Shared USB Hard Drive	Main Office	Attached to Broadband Router and used to store shared data on staff and children.
Laser Printer	Main Office	Attached by USB to Desktop PC 2
Laptop 1	Large Classroom	Standalone – no connectivity
Tablet 1	Indoor Play Area 1	Standalone – no connectivity
Tablet 2	Forest School Area	Standalone – no connectivity

The three Desktop PCs at CB Nursery School are connected directly to ports on their Broadband Router to form a simple LAN. There is a shared USB Hard Drive attached to the Broadband Router. The logical network diagram of CB Nursery School's current LAN is shown below.



CB Nursery School requirements for the upgraded LAN

Essential requirements:

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1. All current desktop PCs, tablets and the laptop to connect to the LAN, with secure Internet access and layered access controls.
2. All current desktop PCs, tablets and the laptop to access the Laser Printer.
3. A file server for storing all staff and children's data securely.
4. Secure wireless access in all classrooms, indoor and outdoor play areas and the forest school area. For use by staff only.
5. Desktop PCs to remain in their current locations.
6. One Desktop PC to be added to the large classroom.

Non-essential requirements:

1. A smart TV to be installed in indoor play area 1.
2. Replace the existing telephone system with new mobile phones and/or Voice over Internet Protocol (VoIP) telephone system for all staff.
3. Addition of a CCTV system that will allow monitoring and recording in all play areas and the forest school area. This will be used to help assess children's social skills and interactions. It will also be used for security outside of school opening hours.
4. Secure wireless access for tablet devices for children's use. These tablet devices will need access to a colour printer and will only allow access to a limited number of websites.

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Task 1

Planning the Local Area Network (LAN)

Topic Areas 1 and 2 are assessed in this task.

The task is:

Create a network design proposal for the LAN.

- You will use the client requirements (essential and non-essential) to create a network design proposal for CB Nursery School.

Your evidence **must** include:

- A network design proposal for the client.
- Written evidence.

Use the assessment criteria below to tell you what you need to do in more detail.

Pass	Merit	Distinction
P1: Create a network design proposal to meet the essential requirements of the LAN. (PO4)	**M1: Explain** the possible ways in which the non-essential requirements of the LAN could be met. (PO2)	**D1: Justify** the choices made in the network design proposal. (PO3)
P2: Describe the advantages and disadvantages for users of the shared services and resources proposed for the LAN. (PO2)		

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Assessment Guidance

This assessment guidance gives you information to meet the assessment criteria. There might not be additional assessment guidance for each criterion. It is only given where it is needed. You must read this guidance before you complete your evidence.

Assessment Criteria	Assessment guidance
P1	• Students **must** identify the objectives required for the LAN in the scenario. • Students **must** identify appropriate specific hardware components to include in the network design proposal, based on their understanding of the essential requirements of the LAN. Depending on the scenario context, hardware components could include specific types of end-user devices, network servers, network connection devices and network organisation. • Students **must** identify appropriate specific software to include in the network design proposal, based on their understanding of the essential requirements of the LAN. Depending on the scenario context, software could include server operating system, network applications, LAN device applications and LAN performance benchmarking tools. • Students **must** identify appropriate specific network transmission media to include in the network design proposal, based on their understanding of the essential requirements of the LAN. • Students are **not** required to list security protocols at this point. • Students **must** identify appropriate shared services and resources to include in the network design proposal, based on their understanding of the essential requirements of the LAN. • The network design proposal could be created in any suitable format.
P2	• Students **must** describe the advantages and disadvantages for users of being able to use each shared service and resource that has been included in the network design proposal.
M1	• Students **must** explain at least **one** way in which each non-essential client requirement could be met, giving clear reasons.
D1	• Students **must** justify the choices made in the network design proposal by providing valid reasons for their choices.

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Task 2
Designing the Local Area Network (LAN)

Topic Areas 2, 3 and 5 are assessed in this task

The task is:
Create design documentation for the upgraded and secured LAN.

- You will create network design documentation for CB Nursery School's LAN.
- Your network design documentation will need to follow common conventions, layouts, and formats.

Your evidence **must** include:

- Network design documentation.
- Written evidence.

Use the assessment criteria below to tell you what you need to do in more detail.

<table>
<tr><th>Pass</th><th>Merit</th><th>Distinction</th></tr>
<tr><td>P3: Create logical and physical designs to meet the client requirements for the LAN.
(PO4)</td><td rowspan="2">M2: Create design documentation which includes the security schema and network configuration to meet the client requirements for the LAN.
(PO4)</td><td rowspan="2">D2: Explain the design decisions made for the LAN and how they meet the client requirements.
(PO2)</td></tr>
<tr><td>P4: Create a network map and hardware device specification to meet the client requirements for the LAN.
(PO4)</td></tr>
</table>

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Assessment Guidance

This assessment guidance gives you information to meet the assessment criteria. There might not be additional assessment guidance for each criterion. It is only given where it is needed. You must read this guidance before you complete your evidence.

Assessment Criteria	Assessment guidance
P3	• For P3, students **must** create logical and physical designs to meet the client requirements for the LAN outlined in their network design proposal from **Task 1**. • All network design documentation **must** follow common conventions, layouts, and formats. Topic Area 2.2 contains components of LAN design documentation which students **must** consider.
P4	• For P4, students **must** create a network map and hardware specification to meet the client requirements for the LAN outlined in their network design proposal from **Task 1**. • The hardware specification **must** provide the specifics of each device on the hardware component list from the network design proposal. • All network design documentation **must** follow common conventions, layouts, and formats. Topic Area 2.2 contains components of LAN design documentation which students **must** consider.
M2	• Students **must** create a security schema that identifies network security, Wi-Fi security and user security to be used on the LAN. • Students **must** create network configuration documentation that identifies the router configuration, network software configuration and end-user device configuration to be used on the LAN. • All network design documentation **must** follow common conventions, layouts and formats. Topic Area 2.2 contains components of LAN design documentation which students **must** consider.
D2	• Students **must** clearly reference specific client requirements (essential and non-essential) when explaining the design decisions that they have made. • Where students have made assumptions about client requirements, such assumptions **must** be clearly stated.

Advice:

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- If you make assumptions about client requirements when creating the network design documentation, then these assumptions must be clearly stated.

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Task 3
Implementing and testing the Local Area Network (LAN)

Topic Areas 3 and 4 are assessed in this task

The task is:

Implement the LAN designed in **Task 2** and test its functionality-

- You will safely connect and configure LAN components to implement an upgraded and secured LAN for CB Nursery School.
- You will also use techniques to test and troubleshoot the implemented LAN.

Your evidence **must** include:

- Videos and/or photos demonstrating the connection and configuration of the LAN.
- A teacher observation record form signed by you and your teacher.
- Documented test results.
- Written evidence.

Use the assessment criteria below to tell you what you need to do in more detail.

Pass	Merit	Distinction
P5: Use technical skills to connect the components of the LAN. (PO4)	**M3: Use** techniques to configure wireless networking, firewall rules and end-user devices to secure the LAN. (PO4)	**D3: Use** technical skills and techniques to **implement** a secure LAN which fully meets the client requirements. (PO4)
P6: Use technical skills to configure the components of the LAN. (PO4)		
P7: Use techniques to securely manage network users. (PO4)		
P8: Describe how the functionality of the LAN will be tested. (PO2)		
P9: Complete testing of the LAN and document test results in an appropriate format. (PO4)	**M4: Use** techniques to test the performance of the LAN and troubleshoot any faults identified. (PO4)	**D4: Analyse** the results from performance benchmarking activities on the LAN. (PO3)
	M5: Use technical skills to configure LAN components to improve performance.	

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	(PO4)	
P10: Explain how the LAN can be maintained. (PO2)		

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Assessment Guidance

This assessment guidance gives you information to meet the assessment criteria. There might not be additional assessment guidance for each criterion. It is only given where it is needed. You must read this guidance before you complete your evidence.

Assessment Criteria	Assessment guidance
	• Students **must** provide clear evidence of them using technical skills when implementing and testing the LAN. The form of evidence selected will vary, e.g. photos or videos of the implementation taking place, and will be supported by a Teacher Observation Record. • A Teacher Observation Record (TOR) **must** be provided for each student as evidence of safely connecting and configuring LAN components, and the techniques used troubleshoot faults (Task 3, Topic Areas 3 and 4). Students **must** also read and sign the TOR form. Each TOR form **must** describe how the student safely used tools and techniques when connecting and configuring LAN components and troubleshooting faults. • Before students are provided with network hardware components to connect and configure, they **must** be informed of all relevant health and safety policies and procedures. Teachers **must** intervene if there's a health and safety risk and reflect this in your assessment if the student needed additional help in order to work safely and independently to meet the assessment criteria in this task.
P5	• For P5 the evidence **must** show use of **at least two** technical skills when **connecting** each type of component identified in the network design documentation. • For this criterion, if students include multiple components of the same type in their network design documentation, they only need to connect **one** of each type.
P6	• For P6, the evidence **must** show use of **at least two** technical skills when **configuring** each type of component identified in the network design documentation. • For this criterion, if students include multiple components of the same type in their network design documentation, they only need to configure **one** of each type.
P7	• The evidence **must** show use of **at least three** techniques that securely manage network users.
P8	• For P8 students **must** provide a description of the techniques they **will** use to test the functionality of the LAN.
P9	• For P9 students **must** provide evidence that they have **both** completed testing on the functionality **and** documented the test results of the LAN. • Students **could** document their testing in the template for test table provided. If it is not clear from the test table what the testing outcomes are, another evidence format **must** be

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Assessment Criteria	Assessment guidance
	used (e.g. screen recording or video) and referenced in the test table.
P10	• Students **must** provide an explanation of ways in which the LAN can be maintained. When writing their explanations students **could** use the content in Topic Area 5.3. • Students **must** give the reasons for, or purposes of, the maintenance that can be carried out on the LAN.
M3	• The evidence **must** show clear use of **at least two** techniques when configuring **each** of wireless networking, firewall rules and end-user devices to secure the LAN.
M4	• The evidence **must** show clear use of **at least three** techniques to test the performance of the LAN. • We do not expect faults to be artificially introduced on the LAN, but when faults are identified students **must** troubleshoot them.
M5	• Students **must** provide clear evidence that the performance of the LAN has been improved by configuring LAN components. This could be evidenced, for example, through providing LAN performance data before and after changing component configurations. • The evidence **could** come from a range of sources, e.g. diagnostics tools, network monitoring and troubleshooting tools.
D3	• Students must provide clear evidence that the implemented LAN is secure, **and** fully meets the client requirements. • To fully meet the client requirements **all** essential requirements and **at least two** non-essential requirements which form part of their network design documentation must be met.
D4	• Students **must** analyse all the results from performance benchmarking activities on the LAN. • The evidence of the analysis could be done in any appropriate format, e.g. adding comments to the evidence created for P9, M4 and M5, creating a separate written report, etc.

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Task 4
Reviewing the Local Area Network (LAN)

Topic Areas 3 and 5 are assessed in this task

The task is:

Review the LAN implemented in **Task 3**.

- You will review the implemented LAN against the scenario requirements and the network design documentation.
- You will need to review the practices, technical skills and techniques used to implement and secure the LAN.

Your evidence **must** include:

- Written evidence.

Use the assessment criteria below to tell you what you need to do in more detail.

Pass	Merit	Distinction
P11: Assess the implemented LAN against the scenario requirements and network design documentation. (PO3)	**M6: Discuss** the effectiveness of the implemented LAN's functionality, performance and security. (PO3)	**D5: Discuss** potential improvements, and further development opportunities for the implemented LAN. (PO3)
P12: Describe how safe working practices have been used when implementing and securing the LAN. (PO2)	**M7: Assess** the effectiveness of the technical skills and techniques used to implement and secure the LAN. (PO3)	

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Assessment Guidance

This assessment guidance gives you information to meet the assessment criteria. There might not be additional assessment guidance for each criterion. It is only given where it is needed. You must read this guidance before you complete your evidence.

Assessment Criteria	Assessment guidance
P11	• Students **must** assess the implemented LAN against both the requirements from the scenario and their own network design documentation. The reasons for any differences **must** be justified.
P12	• Students **must** describe how they have used safe working practices when implementing and securing the LAN. Students **could** consider the content in Topic Area 3.1.
M6	• Students **must** include in their discussion the effectiveness of the implemented LANs functionality, performance and security. For students to meet this criterion All **three must** be covered. • When discussing the effectiveness of the implemented LAN students **must** include **both** strengths and weaknesses.
M7	• Students **must** decide if the technical skills and techniques used to implement and secure the LAN were suitable or not. This reasoned judgement **must** be informed by relevant information.
D5	• Students **must** discuss **both** potential improvements to the LAN and further development opportunities of the LAN. These suggestions must relate to the context given in the scenario.

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Template for test table

Test ID	Test type	Test description	Test data	Expected result	Actual result	Remedial action required	Retest result

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Teacher Observation Record Form

Use this form to record what is observed.
Read the **guidance notes** below the form **before** you complete the form.

Cambridge OCR Level 3 Alternative qualification Cambridge Advanced National in Cyber Security and Networks (Extended Certificate)

Unit number:	F198
Unit title:	Implementing secure Local Area Networks (LANs)
Task number:	3
Task title:	Implement and test the new secure Local Area Network (LAN)

Student's name:	
Date the activity was completed:	

What extra evidence is attached to the form?	

The **teacher** fills in this section:

What Assessment Criteria does this activity relate to? **P5:** Use technical skills to connect the components of LAN. **P6:** Use technical skills to configure the components of LAN. **P7:** Use techniques to securely manage network users. **M3:** Use techniques to configure wireless networking, firewall rules and end-user devices to secure the LAN. **D3:** Use technical skills and techniques to implement a secure LAN which fully meets the client requirements. **M4:** Use techniques to test the performance of the LAN and troubleshoot LAN faults **M5:** Use technical skills to configure LAN components to improve performance.	
How does the activity meet the requirements of the Assessment Criteria? You **must** describe: 1. What the student did 2. How it relates to the relevant Assessment Criteria	
Teacher's name:	

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Teacher's signature:	
Date:	

The **student** fills in this section:

I agree with my teacher's description of how I completed this activity Yes ☐	
Use this space to make any extra comments.	
Student's signature:	
Date:	

Guidance notes

Both the teacher **and** the student are responsible for completing this form.

The **teacher must**:
- use the form to describe in detail what they observed the student doing.
- give contextualised details of what the student did and how this relates to the Assessment Criteria.
- say how well the activity was completed in relation to the Assessment Criteria with reasons.
- share what they have written with the student and offer the opportunity to discuss if the student disagrees with what is written.
- reach agreement with the student before the work is submitted for moderation.
- sign and date the form as evidence of agreement.

The **student must**:
- reach agreement with the teacher before the work is submitted for moderation.
- use the form to show that they agree with the teacher's record of the activity observed.
- sign and date the form as evidence of agreement.

The form **must**:
- be accompanied by extra evidence, as required by the task.
- provide evidence that is individual to the student.

The form **must not**:
- contain a simple repeat of the Assessment Criteria.
- contain just a list of skills.
- be completed by anyone other than the teacher observing the activity and the student completing the activity.
- be written by the student for the teacher to sign.
- be used to evidence achievement of a whole unit or task in isolation.

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NEA Command Words

The table below shows the command words that may be used in the NEA assignments and/or assessment criteria.

Command Word	Meaning
Adapt	• Change to make suitable for a new use or purpose
Analyse	• Separate or break down information into parts and identify their characteristics or elements • Explain the different elements of a topic or argument and make reasoned comments • Explain the impacts of actions using a logical chain of reasoning
Assess	• Offer a reasoned judgement of the standard or quality of situations or skills. The reasoned judgement is informed by relevant facts
Calculate	• Work out the numerical value. Show your working unless otherwise stated
Classify	• Arrange in categories according to shared qualities or characteristics
Compare	• Give an account of the similarities and differences between two or more items, situations or actions
Conclude	• Judge or decide something
Describe	• Give an account that includes the relevant characteristics, qualities or events
Discuss (how/whether/etc)	• Present, analyse and evaluate relevant points (for example, for/against an argument) to make a reasoned judgement
Evaluate	• Make a reasoned qualitative judgement considering different factors and using available knowledge/experience
Examine	• To look at, inspect, or scrutinise carefully, or in detail
Explain	• Give reasons for and/or causes of something • Make something clear by describing and/or giving information
Interpret	• Translate information into recognisable form • Convey one's understanding to others, e.g. in a performance
Investigate	• Inquire into (a situation or problem)
Justify	• Give valid reasons for offering an opinion or reaching a conclusion
Research	• Do detailed study in order to discover (new) information or reach a (new) understanding
Summarise	• Express the most important facts or ideas about something in a short and clear form

We might also use other command words but these will be:

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- commonly used words whose meaning will be made clear from the context in which they are used.
- subject specific words drawn from the unit content.

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